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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,548	04/07/2005	Junichi Onozaki	P27628	7630

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EXAMINER	
BEVERIDGE, RACHEL E	

ART UNIT	PAPER NUMBER
1725	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)
	10/530,548	ONOZAKI ET AL.
	Examiner	Art Unit
	Rachel E. Beveridge	1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *9-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 October 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Newly submitted claim 16 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 16 is dependent upon originally restricted and withdrawn claim 9, wherein claim 9 is an independent classification of invention from elected claims 1-8 (and now newly added claim 17) and therefore lacks unity of invention. More particularly, claims 9-16 require a search within classification 29, subclass 729+ which is not required for the search of elected claims 1-8 and 17 within class 228, subclass 259.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 16 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The examiner reminds that Applicant's election with traverse of claims 1-8 in the reply filed on April 17, 2006 was acknowledged. The new traversal (filed February 8, 2007 and September 27, 2006) is on the ground(s) that the examiner should rejoin the non-elected claims as that they have been amended to apply dependence upon elected claim 1 (see page 11 of the response filed September 27, 2006). This is not found persuasive because claims 9-15 and newly added claim 16 remain within a different classification of invention and therefore lack unity of invention with respect to the elected claims 1-8. Particularly, claims 9-16 require a search within classification 29,

subclass 729+ which is not required for the search of elected claims 1-8 and 17 within class 228, subclass 259. Applicant has merely amended the preamble of the claim to claim dependence upon a completely different class of invention as that the body of the non-elected claims still regard to a solder bump forming apparatus and not to a solder bump forming method as applicant alleges.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 7, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zakel (US 6,070,788).

With respect to claims 1-3 and 17, Zakel discloses a solder layer on a solder screen inside a medium and "above" the substrate, "where the application of the solder onto the terminal faces is effected in a sedimentary manner by means of a screen discharge consisting of solder particles" (col. 3, lines 7-11). Zakel further discloses the sedimentary precipitation of the solder particles on the terminal faces also enables a wetting of irregular surfaces (col. 3, lines 11-14). Zakel's figures 3a to 3c show a method in which a solder layer (16) is disposed on a solder screen (15) in the bath (11), which is tempered to a temperature above the melting temperature of the highest-

melting solder component (col. 5, lines 34-38; hence clearly disclosing a method of melting the solder). Zakel teaches discharging a screen of solder particles (17) via gravity through the bath (11) onto the surface of the substrate (12) disposed below the solder screen (15) in the bath (11) (FIG. 3b) (col. 5, lines 39-42). Moreover, Zakel discloses the formation of solder bumps (14) from the sediment-like deposits of the solder particles (17) on the pads (13) (col. 5, lines 46-48). Zakel teaches the use of liquid organic substances, such as mineral oil or paraffin, and discloses the importance at a specific soldering temperature for a specific substance used as a medium to have a temperature equal to or above the melting temperature of the highest-melting solder component and that it is particularly advantageous to tune the pairing of solder components and medium in a suitable manner to one another (col. 4, lines 37-44). Zakel discloses selective soldering on a substrate having wettable and non-wettable sub-surfaces so that there is adhesion of the solder material only on the wettable surfaces so that the solder material in the medium is not repelled by the non-wettable sub-surfaces (col. 2, lines 30-35). Furthermore, Zakel teaches that the respective wettability of the sub-surfaces may be adjusted for example by means of a suitable surface design (col. 2, lines 35-37). Zakel applies a solder resist onto the substrate surfaces and leaves wettable sub-surfaces exposed (col. 2, lines 39-41). Also, Zakel discloses thickening of the solder bumps via "solder reflow" in the region of the pads (13), while at the same time the remaining surface regions of the substrate (12) repel the remaining molten solder particles which collect at the bottom (113) of the bath (11) (col. 6, lines 39-46). Zakel teaches discharging a screen of solder particles (17) via

gravity through the bath (11) onto the surface of the substrate (12) disposed below the solder screen (15) in the bath (11) (FIG. 3b) (col. 5, lines 39-42). Therefore, by a forced "plunge" or a gravitational drop, it is implied that there is a "specific range" within with the particle falls (col. 5, lines 38-48). Zakel also discloses the use of a gold-tin solder alloy (col. 4, lines 30-34 and col. 5, lines 21-25); therefore, encompassing the broad claim limitation for covering the metal film with gold. However, Zakel lacks specific disclosure of the size range of solder particles within 3 to 15 micron in diameter; but, Zakel teaches a fine-grained solder alloy structure to be an art recognized result effective variable depending on the type of material to be used. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the invention of Zakel to include the instantly claimed ranges in order to enable the formation of binary, ternary or more complex solder alloys, the composition of which is precisely adjustable so as to result in formation of a correspondingly fine-grained, homogeneous structure of the solder alloy (Zakel, col. 4, lines 14-25 and col. 5, lines 17-20). That is it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that there are general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

Regarding claims 4, 5, and 7, Zakel discloses a solder layer on a solder screen inside a medium and "above" the substrate, "where the application of the solder onto the terminal faces is effected in a sedimentary manner by means of a screen discharge

consisting of solder particles" (col. 3, lines 7-11). Zakel further discloses the sedimentary precipitation of the solder particles on the terminal faces also enables a wetting of irregular surfaces (col. 3, lines 11-14). Zakel's figures 3a to 3c show a method in which a solder layer (16) is disposed on a solder screen (15) in the bath (11), which is tempered to a temperature above the melting temperature of the highest-melting solder component (col. 5, lines 34-38; hence clearly disclosing a method of melting the solder). Zakel teaches discharging a screen of solder particles (17) via gravity through the bath (11) onto the surface of the substrate (12) disposed below the solder screen (15) in the bath (11) (FIG. 3b) (col. 5, lines 39-42). Moreover, Zakel discloses the formation of solder bumps (14) from the sediment-like deposits of the solder particles (17) on the pads (13) (col. 5, lines 46-48). Zakel teaches the use of liquid organic substances, such as mineral oil or paraffin, and discloses the importance at a specific soldering temperature for a specific substance used as a medium to have a temperature equal to or above the melting temperature of the highest-melting solder component and that it is particularly advantageous to tune the pairing of solder components and medium in a suitable manner to one another (col. 4, lines 37-44). Zakel discloses tempering of the medium to boiling temperature it is ensured that there is a homogenous temperature distribution in the bath, resulting in the formation of a correspondingly fine-grained, homogeneous structure of the solder alloy (col. 4, lines 17-22). Zakel teaches a medium that creates an inert environment that enables a re-melting of the solder components into an alloy in a reductive environment (col. 4, lines 2-4). Zakel also discloses the use of liquid organic substances, such as mineral oil or

paraffin, and discloses the importance at a specific soldering temperature for a specific substance used as a medium to have a temperature equal to or above the melting temperature of the highest-melting solder component and that it is particularly advantageous to tune the pairing of solder components and medium in a suitable manner to one another (col. 4, lines 37-44). The examiner notes that the medium of glycerol utilized by Zakel is an organic fatty acid. However, Zakel lacks specific disclosure of the size range of solder particles within 3 to 15 micron in diameter; but, Zakel teaches a fine-grained solder alloy structure to be an art recognized result effective variable depending on the type of material to be used. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the invention of Zakel to include the instantly claimed ranges in order to enable the formation of binary, ternary or more complex solder alloys, the composition of which is precisely adjustable so as to result in formation of a correspondingly fine-grained, homogeneous structure of the solder alloy (Zakel, col. 4, lines 14-25 and col. 5, lines 17-20). That is it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that there are general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

Claims 1-5, 7-8, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zakel (US 6,070,788) in view of Schwiebert et al. (US 5,880,017).

With respect to claims 1-3 and 17, Zakel discloses a solder layer on a solder screen inside a medium and "above" the substrate, "where the application of the solder onto the terminal faces is effected in a sedimentary manner by means of a screen discharge consisting of solder particles" (col. 3, lines 7-11). Zakel further discloses the sedimentary precipitation of the solder particles on the terminal faces also enables a wetting of irregular surfaces (col. 3, lines 11-14). Zakel's figures 3a to 3c show a method in which a solder layer (16) is disposed on a solder screen (15) in the bath (11), which is tempered to a temperature above the melting temperature of the highest-melting solder component (col. 5, lines 34-38; hence clearly disclosing a method of melting the solder). Zakel teaches discharging a screen of solder particles (17) via gravity through the bath (11) onto the surface of the substrate (12) disposed below the solder screen (15) in the bath (11) (FIG. 3b) (col. 5, lines 39-42). Moreover, Zakel discloses the formation of solder bumps (14) from the sediment-like deposits of the solder particles (17) on the pads (13) (col. 5, lines 46-48). Zakel teaches the use of liquid organic substances, such as mineral oil or paraffin, and discloses the importance at a specific soldering temperature for a specific substance used as a medium to have a temperature equal to or above the melting temperature of the highest-melting solder component and that it is particularly advantageous to tune the pairing of solder components and medium in a suitable manner to one another (col. 4, lines 37-44). Zakel discloses selective soldering on a substrate having wettable and non-wettable sub-surfaces so that there is adhesion of the solder material only on the wettable surfaces so that the solder material in the medium is not repelled by the non-wettable

sub-surfaces (col. 2, lines 30-35). Furthermore, Zakel teaches that the respective wettability of the sub-surfaces may be adjusted for example by means of a suitable surface design (col. 2, lines 35-37). Zakel applies a solder resist onto the substrate surfaces and leaves wettable sub-surfaces exposed (col. 2, lines 39-41). Also, Zakel discloses thickening of the solder bumps via "solder reflow" in the region of the pads (13), while at the same time the remaining surface regions of the substrate (12) repel the remaining molten solder particles which collect at the bottom (113) of the bath (11) (col. 6, lines 39-46). Zakel teaches discharging a screen of solder particles (17) via gravity through the bath (11) onto the surface of the substrate (12) disposed below the solder screen (15) in the bath (11) (FIG. 3b) (col. 5, lines 39-42). Therefore, by a forced "plunge" or a gravitational drop, it is implied that there is a "specific range" within with the particle falls (col. 5, lines 38-48). Zakel also discloses the use of a gold-tin solder alloy (col. 4, lines 30-34 and col. 5, lines 21-25); therefore, encompassing the broad claim limitation for covering the metal film with gold. However, Zakel lacks specific disclosure of the size range of solder particles within 3 to 15 micron in diameter. Schwiebert et al. disclose a reflowed ball diameter via the equation listed in column 6, lines 1-5. Hence, dependent upon the diameter of the wettable bump limiting metal (d) and the final solder bump height (h) (Schwiebert et al., col. 5, lines 30-36), the diameter (D) of the reflowed ball can be determined. Schwiebert et al. equation is therefore relevant for all possible combinations of these features and further encompasses Applicant's claim of a specific range between 3 and 15 microns. Schwiebert et al. also disclose a metal film covered with gold (Schwiebert et al., col. 4, lines 66-67). Thus, it

would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Zakel to include the solder particle diameter equation of Schwiebert et al. in order to maximize the metal content of the particle while minimizing the oxide content of the particle (Schwiebert et al., col. 8, lines 41-44).

With respect to claims 4, 5, and 7, Zakel discloses a solder layer on a solder screen inside a medium and "above" the substrate, "where the application of the solder onto the terminal faces is effected in a sedimentary manner by means of a screen discharge consisting of solder particles" (col. 3, lines 7-11). Zakel further discloses the sedimentary precipitation of the solder particles on the terminal faces also enables a wetting of irregular surfaces (col. 3, lines 11-14). Zakel's figures 3a to 3c show a method in which a solder layer (16) is disposed on a solder screen (15) in the bath (11), which is tempered to a temperature above the melting temperature of the highest-melting solder component (col. 5, lines 34-38; hence clearly disclosing a method of melting the solder). Zakel teaches discharging a screen of solder particles (17) via gravity through the bath (11) onto the surface of the substrate (12) disposed below the solder screen (15) in the bath (11) (FIG. 3b) (col. 5, lines 39-42). Moreover, Zakel discloses the formation of solder bumps (14) from the sediment-like deposits of the solder particles (17) on the pads (13) (col. 5, lines 46-48). Zakel teaches the use of liquid organic substances, such as mineral oil or paraffin, and discloses the importance at a specific soldering temperature for a specific substance used as a medium to have a temperature equal to or above the melting temperature of the highest-melting solder component and that it is particularly advantageous to tune the pairing of solder

components and medium in a suitable manner to one another (col. 4, lines 37-44). Zakel discloses tempering of the medium to boiling temperature it is ensured that there is a homogenous temperature distribution in the bath, resulting in the formation of a correspondingly fine-grained, homogeneous structure of the solder alloy (col. 4, lines 17-22). Zakel teaches a medium that creates an inert environment that enables a re-melting of the solder components into an alloy in a reductive environment (col. 4, lines 2-4). Zakel also discloses the use of liquid organic substances, such as mineral oil or paraffin, and discloses the importance at a specific soldering temperature for a specific substance used as a medium to have a temperature equal to or above the melting temperature of the highest-melting solder component and that it is particularly advantageous to tune the pairing of solder components and medium in a suitable manner to one another (col. 4, lines 37-44). The examiner notes that the medium of glycerol utilized by Zakel is an organic fatty acid. However, Zakel lacks specific disclosure of the size range of solder particles within 3 to 15 micron in diameter. Schwiebert et al. disclose a reflowed ball diameter via the equation listed in column 6, lines 1-5. Hence, dependent upon the diameter of the wettable bump limiting metal (d) and the final solder bump height (h) (Schwiebert et al., col. 5, lines 30-36), the diameter (D) of the reflowed ball can be determined. Schwiebert et al. equation is therefore relevant for all possible combinations of these features and further encompasses Applicant's claim of a specific range between 3 and 15 microns. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Zakel to include the solder particle diameter equation of Schwiebert et al. in

order to maximize the metal content of the particle while minimizing the oxide content of the particle (Schwiebert et al., col. 8, lines 41-44).

With respect to claim 8, the teachings of Zakel and Schwiebert et al. are the same as relied upon in the rejection of claim 4. Furthermore, Zakel discloses the surface of a substrate (12) having a solder bump distribution (27) of individual, meniscus-like solder bumps (14), which have been formed by wetting on the circular pads (Zakel, col. 6, lines 47-51). See figure 6. Zakel lacks disclosure of the dimensions of each solder bump with relation to the distance between each bump or pad on the substrate. Figure 1B of Schwiebert et al. show the diameter (D) of the solder bump is smaller than the distance (p) between each solder bumps center. Furthermore, Schwiebert et al. disclose creating fine pitches corresponding to the center-to-center distance between each wettable pad (Schwiebert et al., col. 5, lines 4-7). Schwiebert et al. table (col. 5-6) shows that the distance (p) is always greater than the diameter (D) in three different examples. Also, Schwiebert et al. lists many properties and their specific formula's for the dimensions and spacing of the solder bumps on the substrate (Schwiebert et al., col. 5-6). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Zakel to include the spacing requirements of Schwiebert et al. in order to form an efficient flip-chip because of its small size and smallest interconnect option (Schwiebert et al., col. 1, lines 42-44) and further to obtain a low cost, high volume method of producing and assembling integrated circuits (Schwiebert et al., col. 1, lines 20-23).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zakel (US 6,070,788) as applied to claim 4 above, and further in view of Degani et al. (US 5,125,560).

The teachings of Zakel are the same as relied upon in the rejection of claim 4. Zakel teaches a medium that creates an inert environment, which enables a re-melting of the solder components into an alloy in a reductive environment (Zakel, col. 4, lines 2-4). However, Zakel lacks disclosure of the inert liquid specifically containing a flux for the same purpose. Degani et al. disclose utilizing fluxes in a vehicle such as polyethylene glycol with an organic acid such as rosin or abietic acid (Degani et al., col. 2, lines 41-46). Furthermore, Degani et al. disclose the flux being a vehicle and an acid, where the vehicle is typically a liquid solvent (col. 3, lines 38-39). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Zakel to include the disclosure of Degani et al. in order to produce removal of the oxide from the solder bump at reflow temperature (Degani et al., col. 3, lines 39-42).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zakel (US 6,070,788) and Schwiebert et al. as applied to claim 4 above, and further in view of Degani et al. (US 5,125,560).

The teachings of Zakel and Schwiebert et al. are the same as relied upon in the rejection of claim 4. Zakel also teaches a medium that creates an inert environment, which enables a re-melting of the solder components into an alloy in a reductive

environment (Zakel, col. 4, lines 2-4). However, Zakel and Schwiebert et al. lack disclosure of the inert liquid specifically containing a flux for the same purpose. Degani et al. disclose utilizing fluxes in a vehicle such as polyethylene glycol with an organic acid such as rosin or abietic acid (Degani et al., col. 2, lines 41-46). Furthermore, Degani et al. disclose the flux being a vehicle and an acid, where the vehicle is typically a liquid solvent (col. 3, lines 38-39). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Zakel to include the disclosure of Degani et al. in order to produce removal of the oxide from the solder bump at reflow temperature (Degani et al., col. 3, lines 39-42).

Response to Arguments

Applicant's arguments filed September 27, 2006 have been fully considered but they are not persuasive.

Applicant argues that Zakel does not teach or suggest the diameter of the solder particles, much less the range of the solder fine particles being with 3 to 15 micron in diameter (page 9). The examiner first notes the new rejection of record above with regard to this new feature of the claim language after amendment. Furthermore, the examiner disagrees that Zakel does not suggest the diameter of the solder particles and points the applicant to the rejection above for a more detailed explanation of the features of Zakel which suggest this feature.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies

(i.e., "a classification process can be performed based on the falling speed differences of the solder fine particles" and "there is no need to pass the particles through a screen" (page 9)) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The examiner further notes that regardless of addition features taught or suggested by the prior art of record, the claim cannot be found allowable when the prior art teaches, discloses, and/or suggests all of the claimed limitations of the instant invention. Applicant then argues features of the instant invention which are novel in comparison with the prior art of record (see last paragraph on page 9). The examiner notes that while these arguments may be valid, they are not claimed within the instant claims and are not relevant to the discussion of rejection of the claims based on the instantly broad claim language.

Applicant argues the merits of claim 4 for the same reasons argued with respect to claim 1 (page 10). The examiner points the applicant to the new rejection of record above, after amendment to the claim language and disagrees with the applicant's arguments for all of the same reasons as discussed above.

The applicant then argues that claims 6 and 8 should be allowable based on their dependency on claim 4 (page 10). The examiner disagrees for all of the same reasons discussed above for claims 1 and 4.

Applicant also argues the restriction requirement based on the new amendments to the previously withdrawn claims (page 11). The examiner disagrees and points the applicant to review the response in the Election/Restriction section above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel E. Beveridge whose telephone number is 571-272-5169. The examiner can normally be reached on Monday through Friday, 9 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

reb
May 15, 2007

Jonathan Johnson
Primary Examiner